VASCULAR IMAGES

Thoracic aortic occlusion in an adult with coarctation treated with extra-anatomic reconstruction

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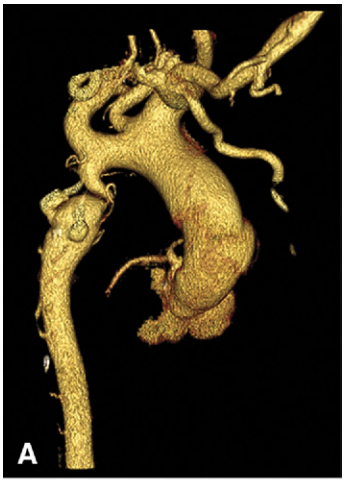
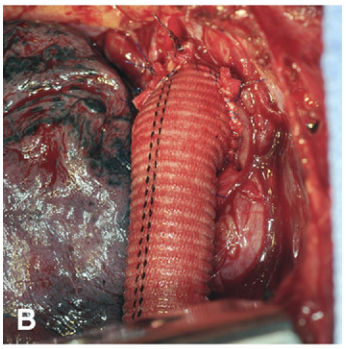
A 52-year-old man with no medical history presented with a 1-month history of intermittent substernal chest pain radiating to the left shoulder and back. Claudication was found to be chronic and only moderately impairing the patients lifestyle. In the emergency department, he was found to have hypertensive urgency with a blood pressure of 210/110 mm Hg, with absent femoral pulses. By computed tomographic angiography, a coarctation of the proximal descending thoracic aorta was identified demonstrating aortic occlusion (*A*) and extensive chest wall collateralization (Cover). After intensive care unit admission, treatment included intravenous administration of esmolol and sodium nitroprusside followed by an echocardiogram and left heart catheterization. Ankle-brachial indexes were calculated, which were 0.6 in the right lower extremity and 0.7 in the left lower extremity. A cardiac evaluation revealed an ejection fraction of 60% with moderate aortic valve stenosis (1.28 mm^2 valve area); the coronary arteries were normal. After 4 weeks of attempted medical optimization with poorly controlled blood pressure on multiple anti-hypertensive agents, operative intervention was undertaken.





At operation, a left posterolateral thoracotomy was performed through the fourth rib interspace. The left subclavian artery and descending thoracic aorta were exposed circumferentially with sharp dissection. After systemic heparinization (100 u/kg), partially occluding clamps were used to perform end-side anastomoses to the respective vessels using a 16-mm collagen-sealed polyester vascular prosthesis (*B*). An immediate postoperative thoracic epidural was placed for pain control followed by chest tube removal on postoperative day 3. Recovery was uncomplicated and the patient was discharged from the hospital 5 days after the procedure. Computed tomographic angiography at follow-up demonstrated a patent bypass (*C*) with relief of the coarctation evidenced by palpable pedal pulses and normalization of pressures in the lower extremities (ankle-brachial index >1.0 bilaterally). The patient blood pressure is now well controlled with two antihypertensives.

Surgical repair of coarctation of the aorta was first described by Crafoord and Nylin in 1945.[1] Campbell et al[2] reported on the natural history of uncorrected thoracic aortic coarctation finding the disease fatal in most beyond the fifth decade of life. Since this time, surgical series that review results of repaired thoracic coarctation in adults have shown significant improvement in arterial hypertension and relief of the pressure gradient between the proximal arterial circulation and the lower extremities; however, a survival benefit conferred by the surgical repair in such patients remains speculative.[3,4] The use of extra-anatomic subclavian to the descending thoracic aortic bypass has been shown by Bauer et al[4] in adults to relieve the coarctation and offers the advantage of avoiding cardiopulmonary bypass and spinal cord protection. Extra-anatomic recon-

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structions in this series were found durable at follow-up.[4] Endovascular treatment of adult coarctation has been performed in large numbers of patients with a high rate of technical success; however, complications after angioplasty or primary stenting include traumatic aneurysmal formation, antegrade and retrograde dissections, restenosis, and the common need for re-interventions.[5] The use of endovascular therapy in adult coarctation with high-grade stenosis/atresia or occlusion is less well defined; thus, open repair was selected as the mode of treatment.

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